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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,027	01/24/2002	Friedrich Jonas	Mo6935/LeA 34,765	3582

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EXAMINER

METZMAIER, DANIEL S

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/057,027	Applicant(s) JONAS ET AL.	
	Examiner Daniel S. Metzmaier	Art Unit 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004 & 21 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-9 are pending. Claims 7 and 8- have been withdrawn as directed to a non-elected invention.

Election/Restrictions

1. This application contains claims 7-8 drawn to an invention nonelected with traverse in the reply filed on 15 September 2003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Specification

2. The specification refers to several prior art references as source materials in making the instant dispersions. It is the examiner's position that one having ordinary skill in the art would have known how to make the 3,4-polyalkylenedioxythiophenes disclosed. To the extent applicants differ in this opinion, they should set forth their position.

The examples refer to example 2 from EP-A 991 303. Said reference example is in other than English and any comparative results in the example have been given no patentable weight. Likewise, no weight is given to reference on page 6, lines 20-21 to the level of impurities.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 1-2, 4-6 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The dispersion property based on the resistivity of the coatings is indefinite. The resistivity is a measured value of a product derived from the claimed dispersions but no method is set forth for how said dispersion was coated or said resistivity was measured. Both the coating and the measurement may significantly effect the resistivity, such as the thickness of the coating or the impurities among other parameters. See Jonas et al, US 5,766,515, column 2, line 66, to column 3, line 4, regarding the dependence of the resistivity on the thickness of the coating.

Claim 2 is indefinite for the limitations set forth therein of "at least about" in defining ranges within the claimed compositions. Attention is directed to MPEP 2173.05.

"However, the court held that claims reciting "at least about" were invalid for indefiniteness where there was close prior art and there was nothing in the specification, prosecution history, or the prior art to provide any indication as to what range of specific activity is covered by the term "about." Amgen, Inc. v. Chugai Pharmaceutical Co., 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991).".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-2, 4-5 and 9 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Louwet et al, US 6,632,472. Louwet et al (examples) discloses aqueous dispersions of poly(3,4-ethylenedioxythiophene) [PEDOT] and polystyrene sulphonate [PSS] having a mean particle size of 50 nm and Table 1 sets forth representative dispersions. Several of the examples having 90% by weight of the particles having sizes less than 58 nm. Applicant's claims set forth dispersions having "at least about 90 %" and a size of "less than 50 nm" or "less than about 40 nm" (emphasis added). Since applicants modify

both the percentage and/or size of particles by “about”, the disclosure in Louwet et al reads on the instant claims.

It is furthermore noted, the prior art characterizes the particle size by weight and the instant claims are 90% of the particles. Said comparison is not and direct comparison and one skilled in the art would expect the percentage based on the number of particles to have a lower particle size than the particle size based on the weight of the particles. This is clear since for two particles having sizes of 58 nm and 50 nm would result in a mass ratio of greater than 1.5 times more mass, i.e., volume, for the 58 nm particle than for the 50 nm particle.

To the extent the Louwet et al differs from the claims in the particle size distribution, it would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the degree of homogenization and/or microfluidization clearly contemplated in the Louwet et al reference. Louwet et al (examples, particularly column 17, lines 1-16) discloses treatment of the dispersions with a homogenizer and a microfluidizer. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the degree of homogenization and/or microfluidization for the advantage of obtaining a more homogeneous and stable compositions and coating resulting therefrom.

9. Claims 1-2, 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Louwet et al, US 6,632,472, as applied to claims 1-2, 4-6 and 9 above, and further in view of Bayer AG, DE 198 41 803 A1, as evidenced by Jonas et al, US 6,391,481.

Louwet et al (examples) discloses aqueous dispersions of poly(3,4-

ethylenedioxythiophene) [PEDOT] and polystyrene sulphonate [PSS] as set forth above. The Louwet et al reference discloses treating the materials with an UltaturaxTM, followed by treatment with a Gualin homogenizer and a MicrofluidizerTM (a high-pressure homogenizer). Said treatment would have been expected to reduce the particle size of the dispersions.

To the extent the Louwet et al differs from the claims in the particle size distribution, Bayer Ag and Jonas et al column 2, lines 7 et seq) teaches the very fine particle size of the dispersions improve the lifetime of the devices employing said materials therein. Bayer Ag and Jonas et al (examples and column 2, lines 7 et seq) disclose 3,4-polyalkylenedioxythiophene/polystyrene sulfonate dispersions (PEDT/PSS, wt ratio = 1:2.5; 1:4; and 1:8). Bayer Ag and Jonas et al further teach that by varying the specific ratio of the conductive polycations (PEDT) to the nonconductive counter-ions or nonionic binders (PSS), the occurrence of short circuits or cross-talk can be significantly reduced.

It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to reduce the particle size of the dispersion for increased particle packing at the coating surface and increased dispersion homogeneity. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the ratio of the PEDT/PSS ratio for the advantage of varying the resistivity and conductivity of the layered formed therefrom.

The coating resistivity of the claims would have been an expected result of varying the PEDT/PSS ratio due to the decrease of the conductive polycations and increase of the nonconductive polyanions clearly contemplated in the reference.

10. Claims 1-2, 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bayer AG, DE 198 41 803 A1, as evidenced by Jonas et al, US 6,391,481; optionally in view of Krafft et al, US 5,370,981. Jonas et al (item 30 on the U.S. Patent face) cited DE 198 41 803 as the foreign priority document. DE 198 41 803 has a publication date of March 2000, more than 12 months prior to the instant filing date. Jonas et al is used as an English language equivalent of the DE 198 41 803 reference and said references are considered to contain the same disclosures or substantially the same disclosures. Jonas et al is referred to for citations.

Bayer Ag and Jonas et al differ from the claims in the particle size and the resistivity.

Bayer Ag and Jonas et al (examples and column 2, lines 7 et seq) disclose 3,4-polyalkylenedioxythiophene/polystyrene sulfonate dispersions (PEDT/PSS, wt ratio = 1:2.5; 1:4; and 1:8). Bayer Ag and Jonas et al column 2, lines 7 et seq) teaches the very fine particle size of the dispersions improve the lifetime of the devices employing said materials therein. Bayer Ag and Jonas et al further teach that by varying the specific ratio of the conductive polycations (PEDT) to the nonconductive counterions or nonionic binders (PSS), the occurrence of short circuits or crosstalk can be significantly reduced.

It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the particle size of the dispersion for increased particle packing at the coating surface and increased dispersion homogeneity. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the ratio of the PEDT/PSS ratio for the advantage of varying the resistivity and conductivity of the layered formed therefrom.

The coating resistivity of the claims would have been an expected result of varying the PEDT/PSS ratio due to the decrease of the conductive polycations and increase of the nonconductive polyanions clearly contemplated in the reference.

Furthermore, Krafft et al (examples) exemplifies PEDT/PSS dispersions and teaches (column 3, lines 11-18) teaches the particle sizes of the dispersions may range from 5 nm to 100 nm. These references are combinable because they teach PEDT/PSS dispersions. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the particle size of said dispersions within the conventional size ranges as shown Krafft et al reference for the advantage of stability and the expectation of a more homogeneous final product.

Response to Arguments

11. Applicant's arguments filed March 22, 2004 and April 21, 2004 have been fully considered but they are not persuasive.

12. Applicants (page 6) assert the methods of coating are disclosed in the specification and the methods of measuring the resistivity are well known in the art. It is further argued that the resistivity is expressed independent of the thickness of the

coating. It is concluded that since the claims are read in light of the specification and the resistivity is independent of the thickness that the claims are definite. This has not been deemed persuasive for the following reasons. The claims are directed to dispersion rather than a coating. The physical property of a final product, i.e., the coating, made from the claimed dispersion is indefinite because the physical property is shown in the art to be dependent on the methods of coating and the parameters of the coating. Unless applicants explicitly set forth in the claim said methods and/or parameters, said physical property as it pertains to the dispersion, which is not the coating, is indefinite.

Applicants' reference to the specification amounts to reading limitations into the claims. Applicants are reminded that claims are given their broadest reasonable interpretation during prosecution.

13. Applicants assert the phrase "at least about" has been amended. This is not the case for claim 2.

14. In contrast to applicants characterization (page 7, lines 1-2, response) of the claimed invention as "at least 90% of the particles of the dispersion are less than 50nm", the claims set forth "about 90% of the particles of the dispersion are less than 50nm" (emphasis added). Applicants' further point out that the percentage is based on the number of particles rather than the percent by weight of the particles.

It is reasonable to conclude that the percentage of the number of particles having particle size less than 50 nm would be higher than a percentage based on the weight since for two particles having sizes of 58 nm and 50 nm would result in a mass ratio of

greater than 1.5 times more mass, i.e., volume, for the 58 nm particle than for the 50 nm particle. Assuming the hypothetical case of 10% of the particles with particle size of 58 nm and 90 % of the particles with particle size of 50 nm. Since the particles would be expected to have the same density, the corresponding percent by weight based on the volume difference for the case of "10 % of the particles" having a particle size of 58 nm would be 15¹% and having a particle size of 50 nm would be 85%.

It is reasonable to conclude that the percentage based on the number of particles would be higher than the corresponding percentage based on weight.

15. Applicants (page 7) assert that Louwet et al discloses 90% by weight of the particles that have sizes from 58 nm to 90 nm is more accurately stated Louwet et al discloses 90% by weight of the particles that have sizes from less than 58 nm.

Applicants are correct in pointing out the differences in measuring the particle sizes. Applicants' claims are directed to the dispersions rather than methods of measuring. Said difference has not been shown to distinguish the dispersions of the Louwet et al reference. In fact, said difference would be expected to represent dispersions of the prior art that read on or are more closely related to the claimed dispersions, not distinguish said dispersions. Please see above analysis.

16. Applicants (page 7) assert that the Louwet et al reference does not teach the coating properties of more than 5000 Ωcm . Since this is a property that depends on the

¹ Volume of 10% of 58 nm particles = 10 particles (10%) $\times \frac{4}{3}\pi 58^3 = 8172832 \text{ nm}^3$. Volume of 90% of 50 nm particles = 90 particles (90%) $\times \frac{4}{3}\pi 50^3 = 47123890 \text{ nm}^3$. Total volume = $8172832 \text{ nm}^3 + 47123890 \text{ nm}^3 = 55296722 \text{ nm}^3$. Corresponding percent by weight of 58 nm = $8172832 / 55296722 \sim 15\%$. Corresponding percent by weight 50 nm = $47123890 / 55296722 \sim 85\%$. Assumes homogeneous density and spherical particles.

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method of coating and applicants have not made the proper nexus between the claimed dispersions and the coatings, which define said property; said property is given little of no patentable weight. The resistance of the coating would have been inherent to the compositions of the prior art since said resistance may be attained by varying the coating methods and/or parameters, such as thickness. Attention is further directed to the above rejection under 35 USC 112, second paragraph, and MPEP 2112.

17. Applicants (page 7 and 8) conclude the particle size is not taught or suggested in the Louwet et al reference. This has not been deemed persuasive for the following reasons.

(1) Said conclusion does not have any basis or foundation.

(2) It has not been shown the compositions claimed differ from the Louwet et al reference. See above remarks and MPEP 2112.

(3) To the extent the compositions of the Louwet et al reference are shown to be different than those claimed, attention is also directed to MPEP 2144.05, wherein "... a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) ...".

(4) Applicants comminute the dispersions by means of ball mills, stirred mills, high-speed stirring, ultrasound, or high-pressure homogenizing. The Louwet et al reference (column 13 to 14, lines 64 to 7) also clearly discloses and/or teaches comminution *via* treatment with an UltaturaxTM, followed by treatment with a Gualin

homogenizer and a Microfluidizer™ (a high-pressure homogenizer). Variation and/or optimization of the homogenization to attain a more stable dispersion would have been well within the ordinary level of skill in the art at the time of applicants' invention.

18. Applicants (pages 8 and 9) assert the Bayer Ag and Jonas et al references lack a teaching of the particle size and the resistivity of the coatings. The Bayer Ag and Jonas et al references broadly teach ranges that would encompass those claimed as an optimum range. The Bayer Ag and Jonas et al references further teach the desire to comminute the dispersed particles.

Applicants arguments regarding the resistivity has not been persuasive for the reasons set forth above regarding the Louwet et al reference and since the coating methods are not defined.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (703) 308-0451. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM